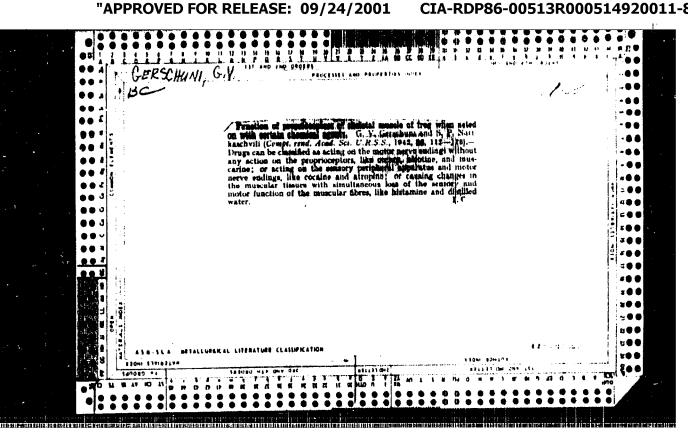
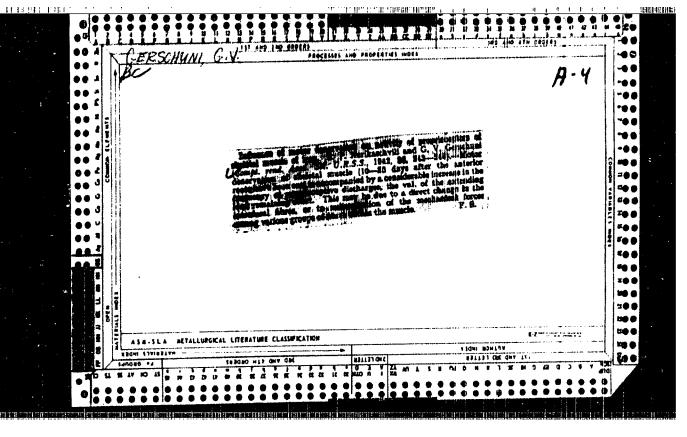
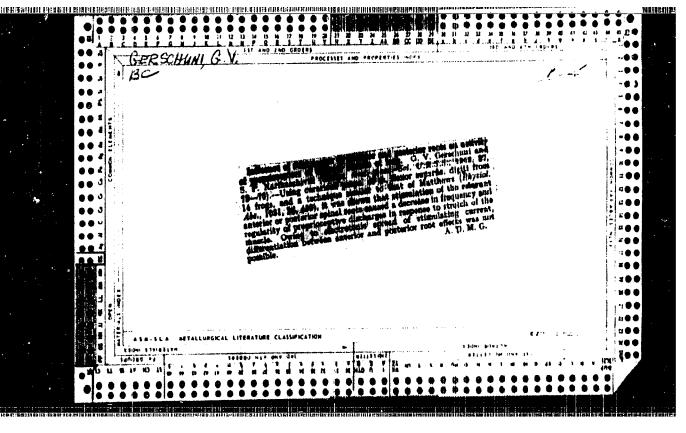
GERSHUNI, G. V.

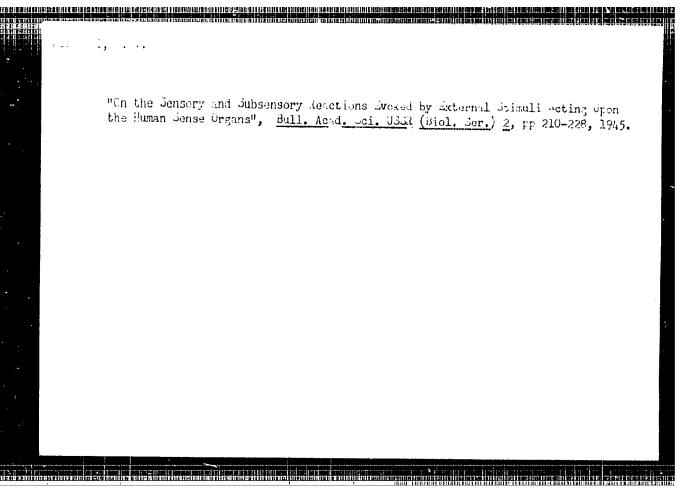
"The Mechanisms of Activities of the Auditory Organ and Some Other Receptors in the Light of Electrophysiological Investigations" (p. 1) by Gershuni, G. V.

SO: Advances in Modern Biology, (Uspekhi Sovremennoi Biologie), Wol. XIII, No. 1, 1940









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	"About the Modification of .	Auditory Sensitivity in Action of Soc	eriā
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Dr. of Fiological Sciences, Institute of Thysiology, im. i.f. Favior.

Member of USSR Academy of Subsensorial Unfelt Reactions Accompanying the Functioning of the Organs.of Sensed

Soviet Source: N: Radyanska Ukraine, Kiev, 13 June 1947

Abstracted In USAF, "Treesure Island", on file in Library of Congress, Air Information Division, Report No. 13433.

GERSHUNI, G. V.

FA 53T57

USSR/Medicine - Barn

Aug 1947

Medicine - Hearing

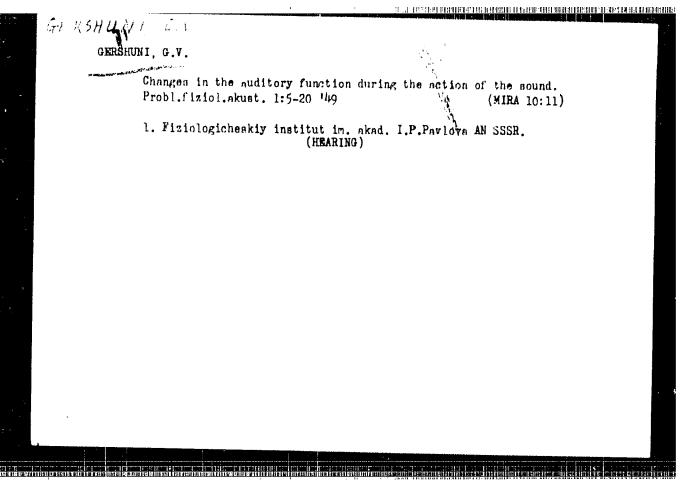
"Subsensory Reflexes in Ear Irritations," G. V. Gershuni, I. I. Korotkin, Lab Physiol Semsory Organs, Physiol Inst imeni I. P. Pavlov, Acad Sci USSR, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LYII, No 4

Describes experiments conducted to determine whether it is possible to have conditional-reflex reactions when conditional signal lies lower than sensory threshold and irritation is not perceived by subject. States that results could not be confirmed. Submitted by Academician L. A. Orbeli, 13 Feb 1947.

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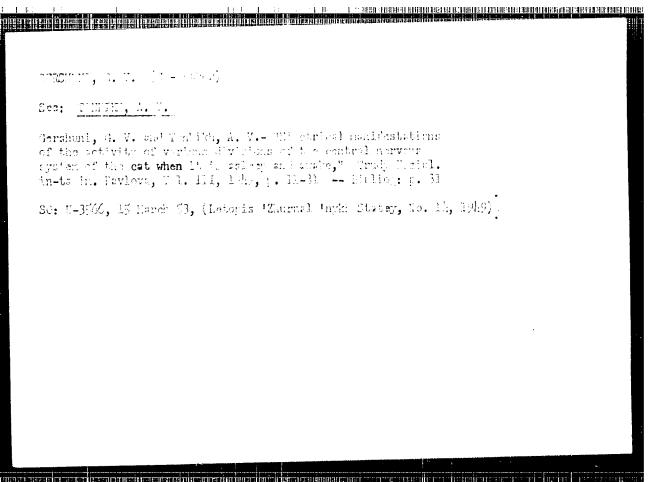
APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

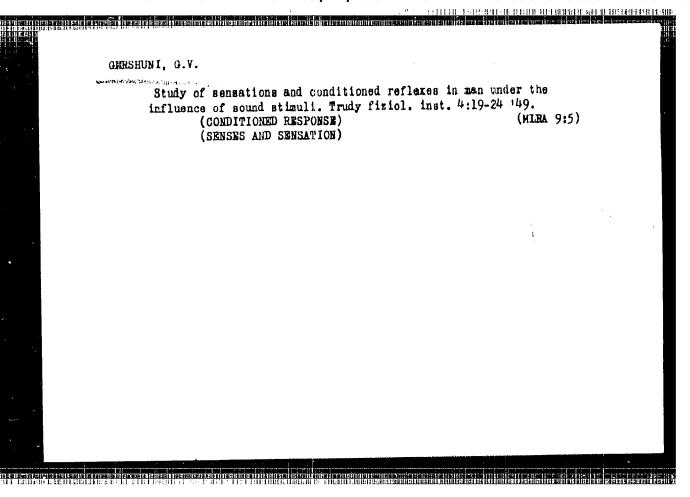


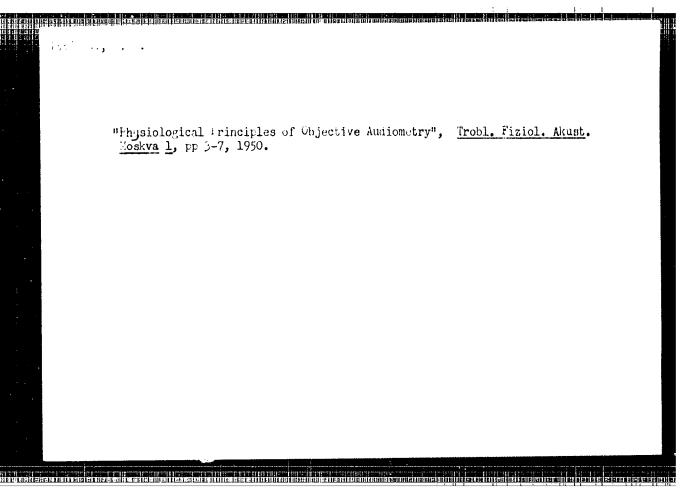
ALEKSZYENKO, W.U.; BLINKOV, S.M.; GERSHUNI, G.V.

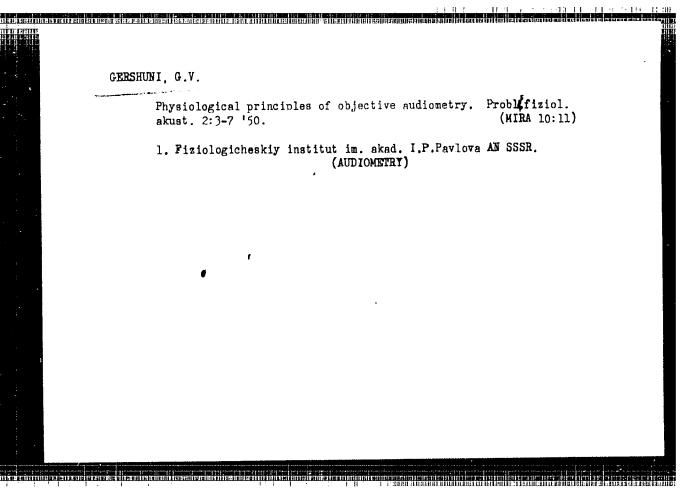
Disorders of perception of sound direction as a symptom of cerebral focal injuries. Prob.fiziol.akust., Moskva 1:93-104 149. (CIML 19:2)

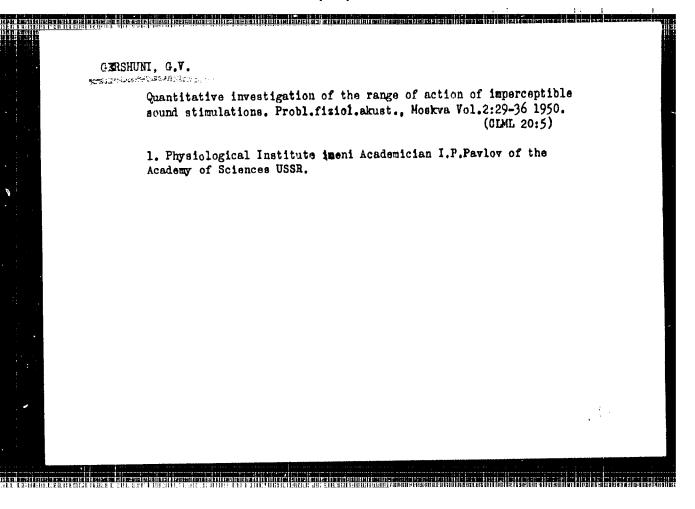
1. Physiological Institute imeni Academician I.P.Pavlov of the Academy of Sciences USSR and the Institute of the Brain of the Ministry of Public Health.











"APPROVED FOR RELEASE: 09/24/2001

CIA-RDP86-00513R000514920011-8

crawn, o. v. BOTEOL AG USSR/Physics - Sound and Light, Oct 51 Intensities of "Lowest Limits of Sound and Light Intensities That Effect the Organs of Hearing and Sight," G. V. Gershun "Zhur Tekh Fiz" Vol XXI, No 10, pp 1202-1204 This article is dedicated to the 70th birthday of Nikolay Nikolayevich Andreyev, Russian physicist. Gershun assumes that conditional reactions surpass sensitivity of organic senses. He presents curves of expti data (cf. A. A. Knyazeva, "Trudy Fiziol" Inst imeni Pavlov, Ak Nauk, No 4, 1949). Submitted 31 Jan 51. 193**T98**

GERSHUNI, G. V.

GERSHUNI, G.V.; KOZHEVNIKOV, V.A.; HATYATOVA, Ye.S.

Studies on certain manifestations of the function of the auditory analyzer in man by means of conditioned cutaneous alvanic reflexes. Vest. oto-rin. 16 no.4:14-20 Jl-Ag 154. (MLRA 7:8)

1. Iz laboratorii slukhovogo analizatora (zav. prof. G.Y.Gershuni) Instituta fiziologii imeni I.P.Pavlova Akademii nauk SSSR i kliniki bolezney ukha, gorla i nosa (zav. chlen-korrespondent Akademii meditsinskikh nauk SSSR V.F.Undrits) I Leningradskogo meditsinskogo insituta.

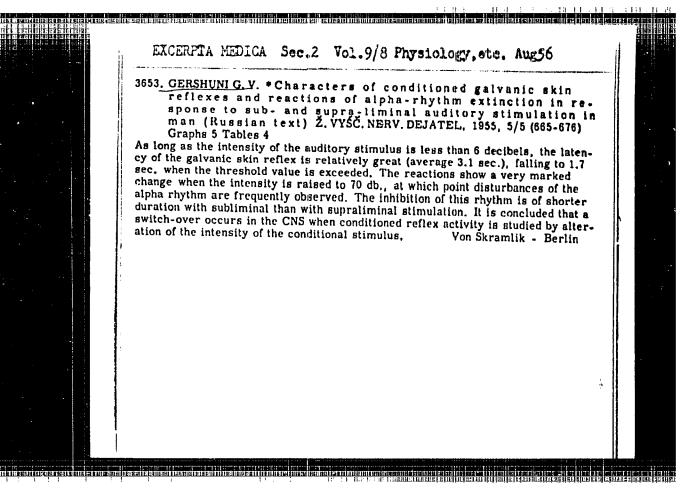
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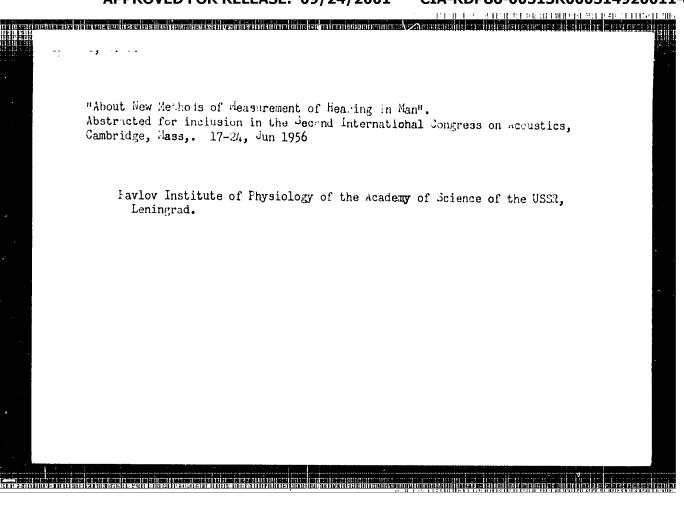
*cutaneo-galvanic, auditory analysor funct. test)

(HEARING TEST,

*cutaneo-galvanic conditioned reflex technic)

GERSHUNI, G.V. Using different reactions as a basis for studying the activity of human sound analysor. Probl.fiziol.akust. 3:45-52 '55. (MLRA 9:5) 1. Iaboratoriya fiziologii slukhovogo analizatora Instituta fiziologii imeni I.P.Pavlova AN SSSR, Leningrad. (HEARING) (REFLEXES)





USSR/Acoustics - Physiological Acoustics. Speech and Singing, J-8

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35634

Author: Gershunin, G. V.

Institution: None

Title: On Certain New Methods of Measuring Hearing of Humans and the

Results Oftained with Them

Original

Periodical: Akust. zh., 1956, 2, No 2, 137-141

Abstract: Explanation of new methods for measuring hearing, based on the use

of conditioned reactions to sound by humans. Data are given to show that the absolute hearing thresholds and differential limits for the frequency and intensity of pure tones can be measured in humans with the aid of these reactions with the same reliability, as when using the verbal response; in some cases one observes conditioned reflexes, which appear to be subthreshold ones within limits of one

to 6 db relative to the verbal response.

Card 1/2

USSR/Acoustics - Physiological Acoustics. Speech and Singing, 3-88

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35634

Abstract: Based on the facts obtained, attention is called to the agenificance of the central mechanisms, that sharpen and coersen the degree of discrimination of frequency and intensety of tonal signals.

Card 2/2

1783. GERSUNI G. V. Lab. of the Physiol. of Acoustical Analyser Pavlov Inst. of Physiol., USSR Acad. of Sciences. General results of investigating the activity of the sound analyser in man by means of various reactions (Russian text) Z.VYSC. NERV. DEJATEL.

The article describes the results of studying the quantitative indices of the function of the acoustical analyser in man - the absolute and differential thresholds on the basis of various reactions. For this aim, in addition to the conventional verbally conditioned reactions, use was made of conditioned eye-lid movements, skin-galvanic, and electro-cortical reactions. All the reactions involved in the study of quantitative indices of the acoustical analyser activity were classified into three groups: (1) verbally conditioned reactions, (2) reactions elaborated with an unconditioned reinforcement and (3) reactions developing 'on the spot', i.e. those which do not require either unconditioned reinforcement in the experiment or verbal instructions. It has been found that: (1) Absolute auditory thresholds and differential threshold for the frequency and intensity of pure tones can be measured in man with the help of these reactions as reliably as by means of verbal responses. (2) In some cases conditioned reflexes have appeared which are subthreshold within 1 to 6 decibels in relation to the verbal response. (3) Changes in absolute and differential sensitivity reaching 25-30 decibels can be discovered, depending on the conditions under which the reactions occur. (4) Preliminary excitation of certain parts of the motor system is one of the important conditions determining the changes in the analyser sensitivity. The article discusses the possible mechanisms determining the variability of the analyser parameters and their conformity with the nature of the activity in question. The author points out the weakness of those schemes of analyser activity which ignore the significance of two-way connections in the integral organism.

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AVAKYAN, R.V.; GERSHUNI, G.V.; RATENBERG, M.A.

Studies of the auditory analysor in signs of hysteric deafness [with summary in English]. Zhur.vys.nerv.déiat. 7 m.3:25-334 My-de'57.

(MIRA 10:10)

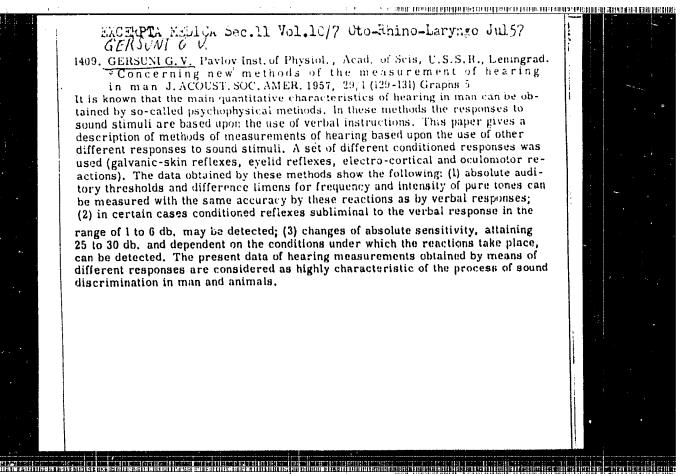
1. Laboratoriya fiziologii slukhovogo analizzatora Instituta fiziologii im. I.P.Pavlova AK SSSR i Leningradskiy nauchno-iseledovatel'skiy institut po boleznyam ukha, gorla, nosa i rechi.

(HEARING TESTS.

in hysteric deafness, conditioned reflex method (Rus))

(REFIEX, CONDITIONED,

in hearing tests in hysteric deafness (Rus))



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USSR / Human and Animal Physiology. Nervous System, Higher Nervous Activity, Behavior.

Abs Jour

: Ref Zhur - Biol., No 15, 1958, No. 70558

Author

: Gershuni, G. V.

Inst

: Not given

Title

: Discrimination by the Human Auditory Analyzer of Complex

Stimuli with Increasing Amounts of Information

Orig Pub

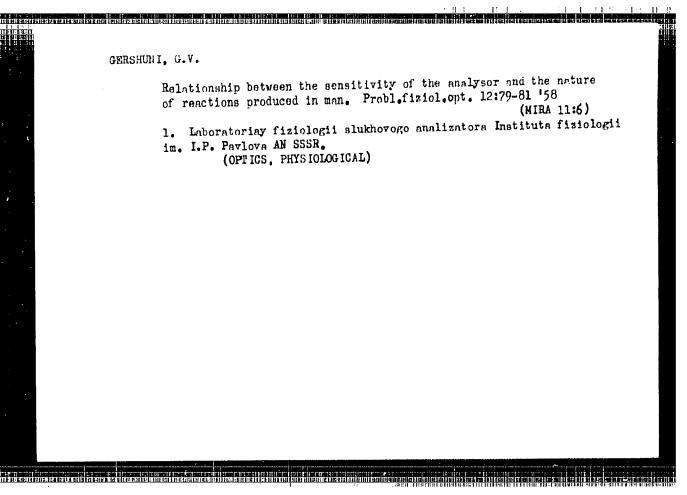
: Fiziol. Zh. SSSR, 1957, Vol 43, No 11, 1086-1097

Abstract

: In addition to its physical complexity, each stimulus is characterized by the complexity of that aggregate of which it is an element. An assessment of this statistical complexity of the stimulus is possible with the use of the methods of the theory of information (I). For any analyzer, various systems of stimuli may be created which may be evaluated according to various signs; the amount of I in the stimulus, the character of the code (the method

Card 1/2

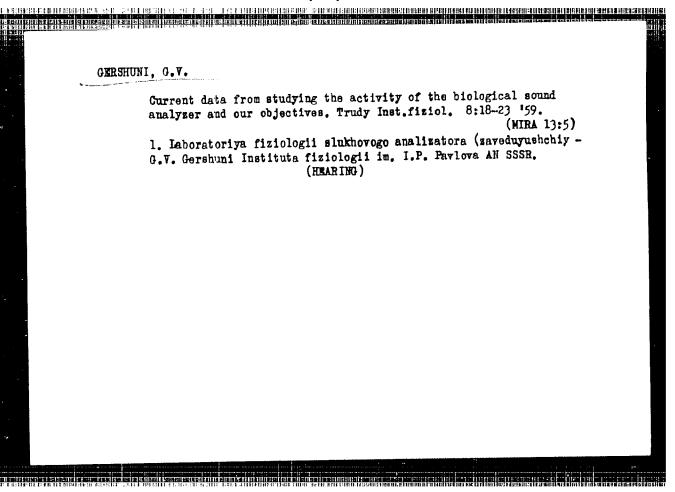
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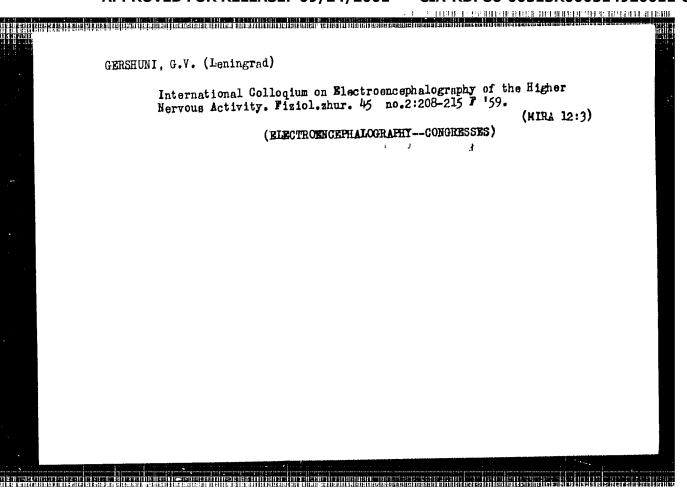
GERCHUNI, G.V.; KNYAZEVA, A.A.

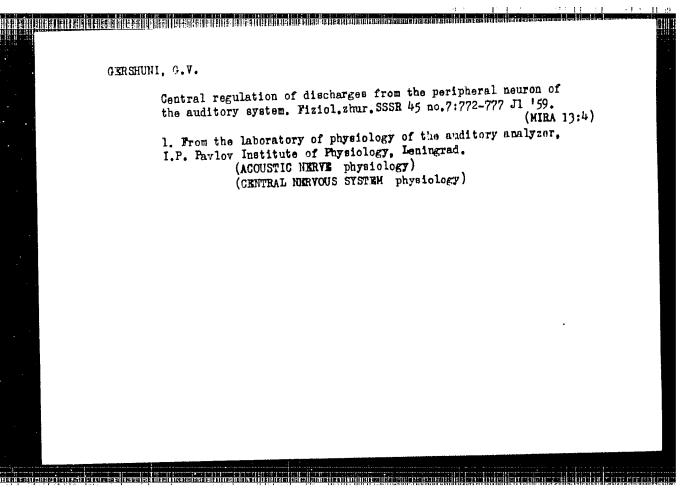
Auditory adaptation under conditions of "distracted attention."
Probl.fiziol.akust. 4:5-15 *59. (MIRA 13:5)

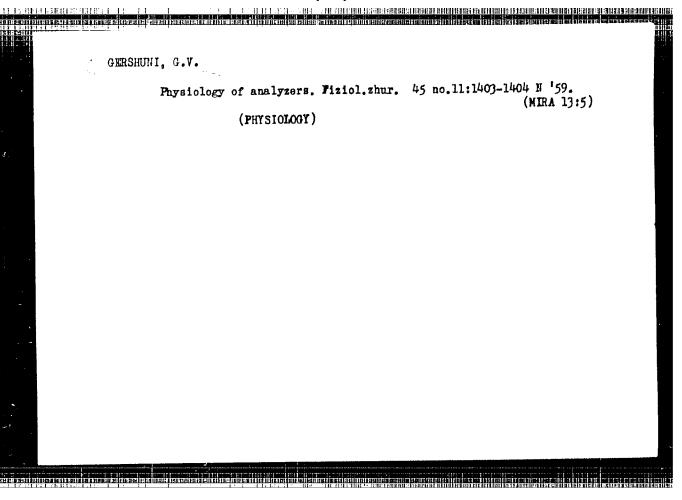
1. Laboratoriya fiziologii slukhovogo analizatora Instituta fiziologii im. I.P. Pavlova AN SSSR i Kafedra bolezney ukha, gorla i nosa 1-go Leningradskogo meditsinskogo instituta im. I.P. Pavlova, Leningrad. (HEARING)



GERSHUNI, G.V.; KLAAS, Yu.A.: LUKOHSKAYA, N.Ya.; LINYUCHEV, M.N.; SAGAL, A.A. Method of evaluating human discrimination of sound stimuli with increasing amounts of information and its use in studying the effect of certain pharmacological substances [with summary in (MIRA 12:4) English]. Biofizika 4 no.2:158-165 '59. 1. Institut fiziology imeni I.P. Pavlova AN SSSR, Leningrad 1-y Leningradskiy meditsinskiy institut imeni I.P. Pavlova. (PHARMACOLOGY. discrimination of sound stimuli with increased amount of information in investigation of eff. of pharmacol. prep. (Rus)) (PERCEPTION, same) (SOUNDS, eff. same)





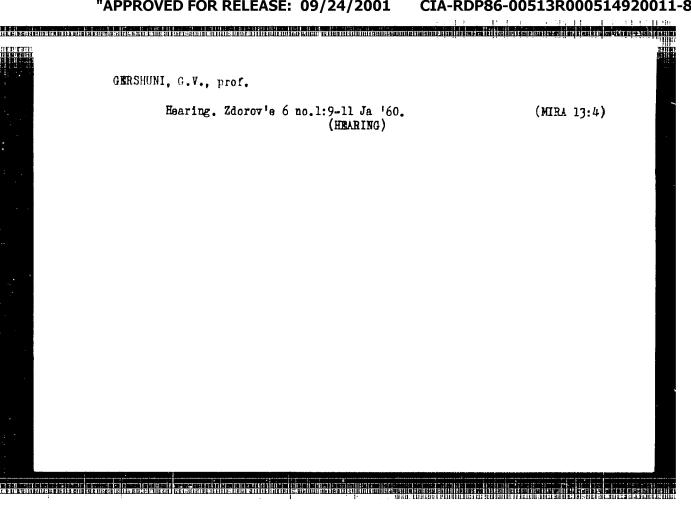


ALEKSEYERKO, N.Yu.; KLAAS, Yu.A.; SHAFRANOVSKIY, K.I., Prinimal uchastiye CHERMAN, T.P. LUPPOV, S.P., otv.red.; GERSHUEL, G.V., prof., red.; GOL'DANSKAYA, M.I., red.izd-va; KRUGLIKOVA, N.A., tekhn.red.

[Physiological acoustics; bibliographical index of Soviet literature, 1917-1950] Fiziologicheskaia akustika; bibliograficheskii ukazatel' sovetskoi literatury, 1917-1950. Moskva, Izd-vo Akad.nauk SSSR, 1960. 136 p. (MIRA 14:1)

1. Akademiya nauk SSSR. Biblioteka. 2. Institut vysshey nervnoy deyatel'nosti AN SSSR (for Aleksayenko). 3. Institut fiziologii im. I.P.Pavlova AN SSSR (for Klass). 4. Biblioteka AN SSSR (for Shafranovskiy, Cherman).

(BIHLIOGRAPHY--HEARING)



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S/046/60/006/003/003/012 B006/B063

24.1500

AUTHOR:

Gershuni, G. V.

TITLE:

Regulation of a Neural Pulse Stream in the Auditory System

PERIODICAL:

Akusticheskiy zhurnal, 1960, Vol. 6, No. 3, pp. 299-306

TEXT: On the basis of electric-physiological examinations of reflexes of various parts of the auditory system (cochlea, geniculate body, cerebral cortex) of living beings the author studies the problem of regulating the current of primary impulses in the organism, which permit the "informative" perception of sound signals. Fig. 1 illustrates the electric reactions of various parts of the auditory system to a sound signal of a duration of 10 msec. The electric oscillations have amplitudes of 50 µv. The dependence of these amplitudes on the sound intensity is shown in Fig. 2. The first nerve stimuli in the cochlea attain amplitudes of nearly 100 µv (at 80 decibels) and are largely dependent on the sound intensity (Curve 1). The amplitudes of the first positive wave are not higher than 10 v. At intensities of more than 40 decibels they are practically no longer dependent on the sound intensity (Curve 2). The first positive wave in the auditory

Card 1/3

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Regulation of a Neural Pulse Stream in the Auditory System

S/046/60/006/003/003/012 B006/B063

area of the cortex attains amplitudes of up to 70 µv, and the dependence of the amplitudes on the sound intensity decreases rapidly (Curve 3). Next. the author discusses special electric reaction diagrams which were taken under different conditions, and studies the effects of disturbances (e.g., anesthesia, partial destruction of the auditory area of the cortex) The results discussed here were, for the major part, published by Ya. A. Alitman. They illustrate the importance of the various ways of impulse regulation in the organism. 1) The current of impulses resulting from an acoustic stimulation in a nerve is limited. The secondary current caused by this current are also limited. 2) The current of impulses resulting from the action of a special system of (reverse) connections radiating from the center is limited. 3) The current of impulses in the higher ranges of the auditory system changes under the action of sections of the central nervous system outside the auditory system. The author discusses two mechanisms of the regulation of information transmitted by of nervous impulses which may occur in the auditory system under the action of sound. The first mechanism consists in a change of the participating elements, and the second one in a change of the level of the characteristic noise in the system, Mention is made of Nikolay Nikolayevich Andreyev and

Card 2/3

Regulation of a Neural Pulse Stream in the S/046/60/006/003/003/012 Auditory System S/06/B063

A. M. Maruseva. There are 5 figures and 24 references: 13 Soviet and 3 US.

ASSOCIATION: Institut fiziologii im. I. P. Pavlova Leningrad

(Institute of Physiology imeni I. P. Pavlov, Leningrad)

SUBMITTED: May 18, 1960

Card 3/3

GERSHUNI, C.V.

Evaluation of the functional significance of electrical responses of the auditory system. Responses to short sounds (clicks) and the determination of the initial moment of the stimulus action. Fiziol. zhur. 48 ho.3:241-250 Mr '62. (MIRA 15:4)

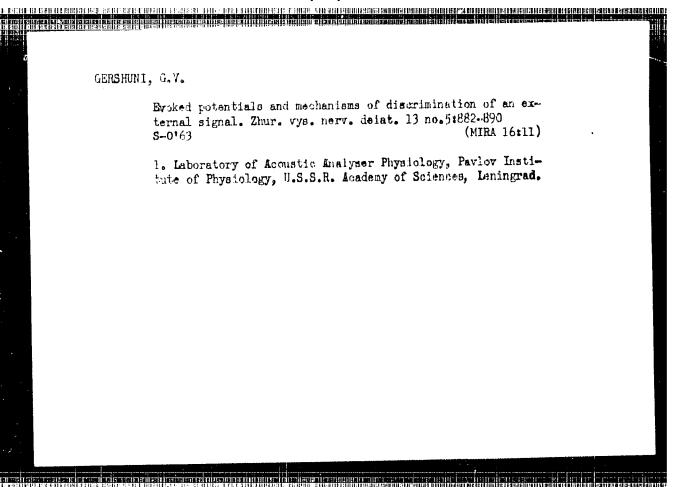
1. From the Laboratory of Auditory Analyser Physiology, I.P.Pavlov Institute of Physiology, Leningrad. (HEARING) (ELECTROPHYSIOLOGY)

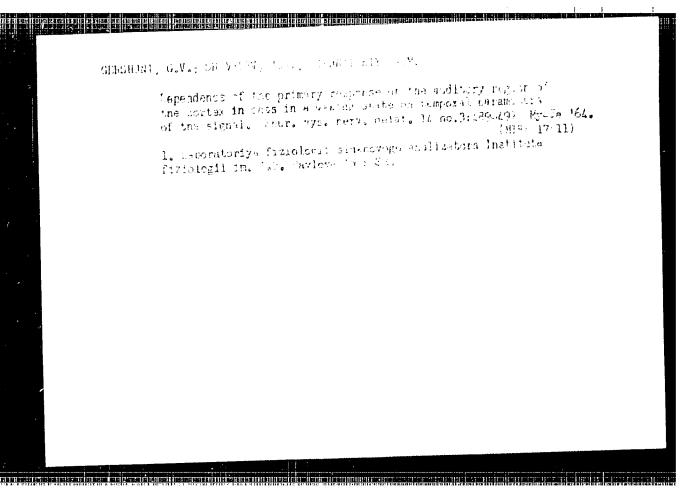
KUZIN, A.M., glav. red.; GEL'FAND, I.M., red.; LIVANOV, M.N., red.; GERSHUNI, G.V., doktor med. nauk, red.; KHURGIN, Ya.I., doktor fiz.-matem. nauk, red.; KOCHEREZHKIN, V.G., kand. biol. nauk, red.; GURFINKEL', V.S., red. izd-va; POLENOVA, T.P., tekhn.red.

[Biological aspects of cybernetics]Biologicheskie aspekty kibernetiki; sbornik rabot. Moskva, Izd-vo Akad. nauk SSSR, 1962.
237 p. (MIRA 16:1)

1. Akademiya nauk SSSR. Nauchnyy sovet po kompleksnoy problems "kibernetika." 2. Chlen-korrespondent Akademii nauk SSSR (for Kuzin, Gel'fand, Livanov).

(CYBERNETICS)





BIBIKOV, Ye.S., kand. tekhn. nauk (Chelyabinsk); GERSHUNI, G.V., prof.

Is our ear a radio loudspeaker? Priroda 53 no.9:124-125 '64.

". (MIRA 17:10)

1. Institut fiziologii im. I.P. Pavlova (for Gershuni).

G:	easmint, G.V.
	Organization of afferent flow are the process of on the area of signals of various duration. There was, here delat. 15 hours (MER 18:5) 260-273 Mr-Ap 165.
	1. Institut fiziologii imeni L.P. Pavlova AN CSSE, Leningcai.
· .	

GERSHUNI, G. Z.

1 Oct 52

USSR/Physics - Heat Transfer

"Free Thermal Convection in Space Between Vertical Coaxial Cylinders," G. Z. Gershuni, Molotov State Univ imeni Gor'kiy

DAN, Vol 86, No 4, pp 697-8

Investigates thermal convection in a liquid between coaxial cylinders at different temperatures. Finds that heat transfer from hot to cool cylinder depends on molecular thermal conductivity of liquid. It holds true as ling as Gr. Pr 13 (Prandl-Grasshof number). Ovee this limit solution is unstable and turbulence occurs. Presented by Acad M. A. Leontovich 3 Jul 52.

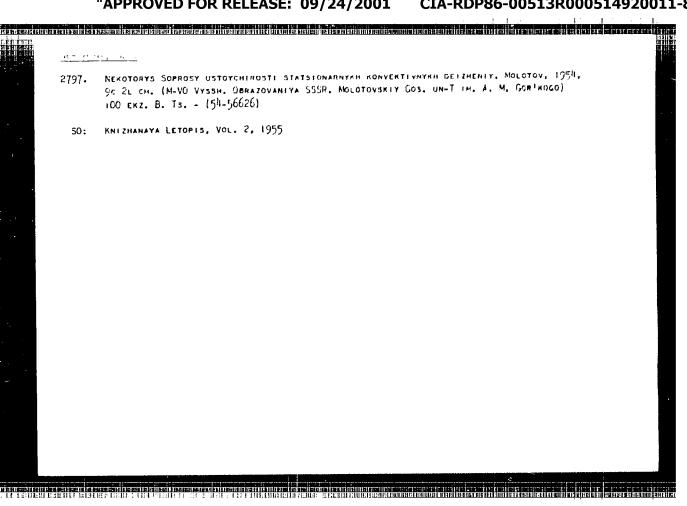
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GENERALL, G. 1.

"Sound Absor tion in a Ferromagnetic hear the Carle Point," Jan. 22. Follows, un-te', No 1, 29 59-71, 1953

Anomalously high seums absorption in a ferromagnetic near the Carle point, and to energy dissipation of the cound wave, is analyzed. A formula of linear absorption is derived. (Schfir, No 5, 1955)

Sum. No. 681, 7 Let 15



"A Certain Case of Colution of Convection Problem With Adecuat of Paris of Victorian Coefficient to Temperature" Uch. Zap Molotovsk. un-ta, 8, No 3, 1954, 87-90

Equations of convection are solved taking into account of the viscosity in the case of an infinite vertical slit with plane paralled walls heated to different temperatures. Exact stationary solutions are found in two cases in which the ratio of viscosity to temperature is linear and may be expressed by Bachinskiy's formula. The temperature distribution in this case is linear and the heat transfer from hot to cold wall is determined by the molecular heat conductivity of the liquid. (REMFIE, No 9, 1955)

SO:: Sum-No 787, 12 Jan 50

GERSHUNI, G. Z.

"Certain Problems of the Stability of Stationary Convective Movements." Cand Phys-Math Sci, Molotov State U, Min Higher Education USSR, Molotov, 1954. (KL No 2, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12) SO: Sum. No. 556, 24 Jun 55

વારા પ્રાપ્ય છે. કારફ માં કેનાંને મિકાનિના મિકાનિનાના માં મેનિકાનિનાના માં માં મારા મારા મારા મારા માં માના મા

USSR/Physics - Convective movement stability

FD-3051

Card 1/2

Pub. 153 - 20/23

Author

: Gershuni, G. Z.

Title

: Problem of the stability of planar convective movement of a liquid

Periodical

: Zhur. tekh. fiz., 25, February 1955, 351-357

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Abstract

Earlier the author investigated (ibid., 23, 1838, 1953) the stability of stationary convective movement of a liquid between vertical parallel planes heated to different temperatures or between planes arbitrarily oriented relative to the gravitational field, the investigation showing that for various angles of inclination the crisis of stationary movement occurs for different causes; further, this problem is of interest for its own self since it relates to the practical important problem of heat transfer through liquid or gas layers. In the present work the author considers the convective movement of a liquid in the portion of a planar slot remote from the ends which is formed by two planes between which is maintained a constant temperature difference T. He drives

Card 2/2 FD-3051

Abstract : the related equations and solves. He clarifies that the so called

threshold of convection is a special case of the occurrence of turbulence, as noted by V. S. Sorokin (Prikl. mat. i mekh., 18, 197, 1954). He thanks V. S. Sorokin for discussions. Seven references: e.g. V. S. Sorokin, Prikl. mat. i mekh., 17, 39, 1953.

Institution : -

Submitted: June 25, 1954

SOV/139-58-4-6/30 AUTHORS: Gershuni, G. Z. and Zhukhovitskiy, Ye. M.

Two Types of Unstable Convective Flow Between Paraliel TITLE: Vertical Planes (O dvukh tipakh neustoychivosti konvektivnogo dvizheniya mezhdu parallel'nymi vertikal'nymi ploskostyami)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1958, Nr 4, pp 43-47 (USSR)

ABSTRACT: The stability of stationary convective flow between parallel vertical planes held at different temperatures has already been investigated by the first author, using Galerkin's method (Ref.1). In the present paper the authors have used a more complicated form for the approximating functions (see Eqs. 5), and have so found a more accurate approximate solution. This has allowed a more accurate calculation of the earlier results and has in addition uncovered a second type of instability, not given in the earlier work at all, a type with null phase velocity which the authors call a "standing disturbance" as opposed to a "travelling disturbance". Taking the planes to be $x = \pm 1$, the dimensionless equations for Cardl/4 stationary convective flow are given by Eq.(1). The

SOV/139-58-4-5/30 Two Types of Unstable Convective Flow Between Parallel Vertical Planes

stream and temperature functions ϕ and Θ of plane narmonic disturbances are given by Mqs.(2) and (3) with boundary conditions as in Eq.(4). G and P are the Grasshof and Frandtl numbers, k and ω the wave number and complex frequency of the disturbance. These equations were derived by the first author (Ref 1), The question of stacility has thus been reduced to that of finding the eigen-values of equations (2) to (4). The authors find an approximate solution to this problem by assuming forms for ϕ and of the type given in Eq. (5). They then make plausible guesses at φ_1 , φ_2 , Θ_1 , Θ_2 , see Eqs.(6) and (8). All boundary conditions are now satisfied by the approximate solution. This solution differs from the cruder approximation the first author used previously (Ref 1) in that the stream function ϕ is now the sum of two functions, with two variable coefficients, and that the additional boundary condition on Θ , Eq.(7), is taken into account. Using Galerkin's method, the authors obtain Eq.(12) for real eigen values of w, and Eq.(11) for the corresponding Card2/4 relation between G and k. Eliminating w between

S0V/139-56-4-6/30

Two Types of Unstable Convective Flow Between Parallel Vertical Planes

Eq.(11) and Eq.(12), ϵ curve is obtained in the (G,k) plane which the authors call a 'neutral curve' - i.e. one corresponding to real values of ω . From the position of the minimum on this curve the critical values of the Grasshof number G and the wave number k can be found, $\omega=0$ gives a solution of Eq.(12), and the corresponding curve of G_m against $\log P$ is shown in Fig.1. In the range shown k_m was practically constant, increasing only from 1.6 to 1.7. This is the instability that was not revealed in the earlier work (Ref 1). Excluding $\omega = 0$, for P > 1.8 the authors obtain the second type of instability - the "travelling" type. For this type $\log G_{\rm m}$ is plotted against $\log P$ in Fig.2 (full line). Eq.(14) is asymptotically true, and a good approximation for P > 50. For this type k_m increases from 0 to 1.6 at P > 50. For this type of disturbance there is a good agreement with the author's earlier work (Ref 1). Thus eq.(14) was also obtained, though with 224 instead of 214 in the numerator, and the asymptote was reached at P=0.96. Card3/4 The main results can be summarised thus:

507/139-58-4--6/30

Two Types of Unstable Convective Flow Between Farallel Vertical Planes

For convective flow between two parallel planes neld at different temperatures, instabilities appear if there is a large temperature difference between the planes. "Standing" disturbances correspond to P<1.3, both types are possible for P>1.8, though for P>2.2 the "travelling" disturbances are the more dangerous as they correspond to a smaller Grasshof number. There are 2 figures and 1 Soviet reference,

ASSOCIATIONS: Permskiy gosuniversitet (Perm' State University) and Permskiy pedagogicheskiy institut (Perm' Fedagogic Institute)

SUBMITTED: January 8, 1958

Card 4/4

SOV/126-6-2-22/34

AUTHORS: Gershuni, G. Z. and Zhukhovitskiy, Ye. M.

TITLE: Forced Vibrations in an Elasto-Plastic System

(Vynuzhdennyye kolebaniya v uprugo-plasticheskoy sisteme)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 2, pp 339-346 (USSR)

ABSTRACT: Forced vibrations in an elasto-plastic system beyond the elastic limit are considered. Friction and hysteresis are taken into account. The resonance properties of such a system are discussed and compared with the experimental data given in Refs. 1 and 2. The equation of motion of a point under the action of an elasto-plastic force F(x) and an external force F(x) is of the following form

$$\lim_{x \to \infty} + \lambda x + F(x) = G \sin(\omega t + \varphi)$$
 (2)

where λ is the coefficient of friction and F(x) is given by:

$$F_{I} = k_{1}x, F_{II} = F_{m} + k_{2}(x - x_{m}),$$

$$F_{III} = k_{1}(x - \Delta), F_{IV} = -F_{m} + k_{2}(x + x_{m} - \Delta).$$
(3)

Card 1/4

SOV/126-6-2-22/34

Forced Vibrations in an Elasto-Plastic System

where the various constants have the meaning indicated in Fig.1. The above equation is then re-written in the dimensionless form

$$x + \beta x + f(\lambda) = g \sin (pt + \varphi)$$
 (4)

where

$$p = \omega/\omega_{o}, g = G/F_{m}, \beta = \lambda/m\omega_{o}, f + F/F_{m}$$

$$f_{I} = x, f_{II} = 1 + \alpha (x - 1),$$

$$f_{III} = x - \delta, f_{IV} = -1 + \alpha (x + 1 - \delta),$$

$$\delta = \frac{\Delta}{x_{m}} \text{ and } \alpha = \frac{k_{2}}{k_{1}}.$$
(5)

The problem consists of finding periodic solutions of the above equation which have a period 277/p, i.e. equal to the period of the forcer. The appropriate system of boundary conditions is given by Eq.(6). The equations are solved by an approximation method suggested by B. G. Galerkin.

Forced Vibrations in an Elasto-Plastic System SOV/126-6-2-22/34

In the case β = 0 the resonance curves are as shown in Figs. 2 and 3 ($\alpha = k_2/k_1$; cf. Fig.1). The form of the curves indicates the presence of considerable absorption due to hysteresis. The assymmetry of the curves becomes more pronounced as α decreases. The low frequency side of the resonance curve is steeper than the high frequency side. When the coefficient of friction is not zero the resonance frequency beyond the elastic limit increases as friction increases. In general, the resonance frequency decreases at larger amplitudes of vibration and the relation between the amplitude of vibration and the amplitude of the forcing function is non-linear. The problem was suggested by Professor M. Kornfel'd. There are 7 figures and 4 references, 3 of which are Soviet, 1 English.

Card 3/4

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

SOV/ 56-34 - 3-20/55 Gershuni, C. Z., Zhukhovitskiy, Ye. M. AUTHORS: TITLE: The Stationary Convective Motion of an Electrically Conducting Liquid Between Parallel Surfaces in a Magnetic Field (Statsionarnoye konvektivnoye dvizheniye elektroprovodyashchey zhidkosti mezhdu parallel'nymi ploskostyami v magnitnom pole) Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, PERIODICAL: Vol. 34, Nr 3, pp. 670-674 (USSR) ABSTRACT: The two planes referred to in the title may be heated to various temperatures. First, the equations of the motion of the medium (these are the equations of convection in the case investigated here) and the Maxwell equations for the field in the medium are written down. In the equation for the curl of the magnetic field, the displacement current is neglected and in the equation of heat conduction - the tough dissipation and Joule dissipation. The electric field strength and the current density are eliminated first from Maxwell's equation. The above-mentioned equations are subsequently converted into dimensionless variables. 4 dimensionless parameters occur in Card 1/3 these equations. The authors investigate here the steady

SOV/56-34-3-20/55 The Stationary Convective Motion of an Electrically Conducting Liquid Between Parallel Surfaces in a Magnetic Field

convection in the space between vertical parallel surfaces in the case of the presence of an exterior magnetic field which is vertical to the surfaces. If the linear dimensions of the surfaces are sufficiently ε reat compared with the distance between them, then an accurate solution of the above--mentioned dimensionless equations can be determined which describes the steady solution in the part distanced from the ends of the gap formed by the surfaces. This motion has the following pecularities: 1) The velocity v is always parallel to the z-axis, 2) The temperature T depends only on x. 3) The field-vector H is situated everywhere in the surface (xz), viz. it holds $H_y = 0$: 4) All values do not depend on y (plane problem) and except pressure, neither on z. In this case the z-axis is parallel to the surfaces and the x-axis is vertical to them. The authors determine here the distribution of temperature, velocity and field strength on the cross section. First, T = -x is found. Also the terms for the velocity distribution and the magnetic field strength are given explicitely; all these formulae together represent the solution of the problem discussed here. A diagram demonstrates the velocity-distributions for the Gartman numbers M=0.5,10.

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CIA-RDP86-00513R000514920011-8 "APPROVED FOR RELEASE: 09/24/2001

SOV/56-34-3-20/55

The Stationary Convective Motion of an Electrically Conducting Liquid Between Parallel Surfaces in a Magnetic Field

The velocity distribution $v = Gx(x^2 - 1)/6$ is obtained with lacking field. The motion decreases rapidly with increasing field strength. Moreover, a peculiar boundary layer occurs in the flow: A thin layer with an important gradient of velocity is formed in the vicinity of the walls. Also the distribution of the induced magnetic field on the cross section is demonstrated by a diagram. Concluding, a formula for the vertical convective thermic flow is given. The solution found here describes the motion in a vertical gap in the presence of a transversal external field. It may, however, be readily generalized for cases with inclined gap and with an external field oriented at random. There are 2 figures and 3 references, 1 of which is Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm State University), Permskiy pedagogicheskiy institut (Perm Pedagogical Institute)

SUBMITTED:

September 19, 1957

Card 3/3

AUTHORS:	Firshing, G. Z., 2hukhovitskiy, Yo. M. SOV/56-34-3-21/55
TITLE:	On the Stability of Steady Convective Motion of an Electrically Conducting Liquid Between Parallel Vertical Thanes in a Magnetic Field (Ob ustopchivosti staticus rhogo korv bijanoro dvizheniya elektroprovodynahobev zbidkosti pozhdu parallel'nymi vertikal'nymi pleahostychi vergotnos pole)
PERIODICAL:	Zhurnol Ekaperisental'noy i Teoreticheskov Fiziki, 1959, Vol. 11, ir 3, pp. 175-683 (USUR)
ABSTRACT:	First the authors refer to earlier works desling with the same subject emong them one published by themselves (Ref.1). The generalization to the case of random position of the clanes is more difficult than in the case of the steady problem and it can be carried out in the same way as G.Z. Gershu in his study (Ref.5). First the equations for the perturbations are put down, the authors here involved two-dimensional parturbations. Also a current function and a vector potential are introduced. The sign of the inaginary
Card 1/ 4	a vector potential are introduces. The sign sector

On the Stability of Stealy Conserve atras of an electri- SOV/56-34-3-21/55 cally Conducting Liquit Setween Parallel Vertical Flanes in a second tic Field

part of the frequency w determines the behaviour of small porturbations. The authors then mention the differential equations for the amplitudes of the perturbations of velocity and temperature must disappear in the parellel countary planes bounding the liquid; the corresponding boundary conditions are met fown. The parturbations of the magnetic field need, in general, not listoppenr; as boundary con ditions for the field serve the usual conditions on the separating surfaces of the media. Furthermore two possible orientations of the constant external field are investigated: 1.-The construct homogenous external field is situated at right angles to the parallel plant and thus also to the vector of the velocity of the steady motion of the liquid. 2.-The externed field has the same direction as the velocity. With long the timel and at a with transverse fields the amplitude of the vector potential of the parturbation of the field can be eliminated from the equations. The problet then reduces to the finding of the amplitudes of the current function and of peaperature from the given equations of the problem and the bondary conditions pertaining to it.

Cord 2/4

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

On the Stability of Stealy Convective Notion of an Sov/56-34 -3-21/55 Electrically Conducting Liquid Between P rallel Vertical Planes in a Magnetic Field

This problem will have a solution only for certain values of the complex number ω . In the second chapter of this work the problem formed is actived by approximation according to the method by Talertin, the course of computation being followed step by step. The results obtained are discussed separately for the case of a longitudinal and a transverse field. In the transverse case the critical wave number k decreases monotonously with increasing M

i.e. with the magnetic field becoming stronger the anvelength of the steady perturbations increases. Besides, the investigated steady motion is unstable also with regard to nonsteady perturbations when a transverse field is present. Such a instability appears at sufficiently great field strongths. A diagram shows the dependence of the critical wave number on the field strength. In the case of a longitudinal field the stability can be compensated only by steady perturbations with $\omega = 0$. A longitudinal field increases the stability of motion

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Off the Stability of Steady Convective Motion of an SOV/56-34 =3-21/55 Electrically Conducting Liquid Between Parallel Vertical Tiries in a Magnetic Field

much less than a transverse field. In a lengitudinal field the critical wave number decreases monotonously with increasing field strength. The qualitative results obtained can be made more precise by their

approxime than to not used. There are 2 figures, I table and 9 references, 4 of which are Soviet.

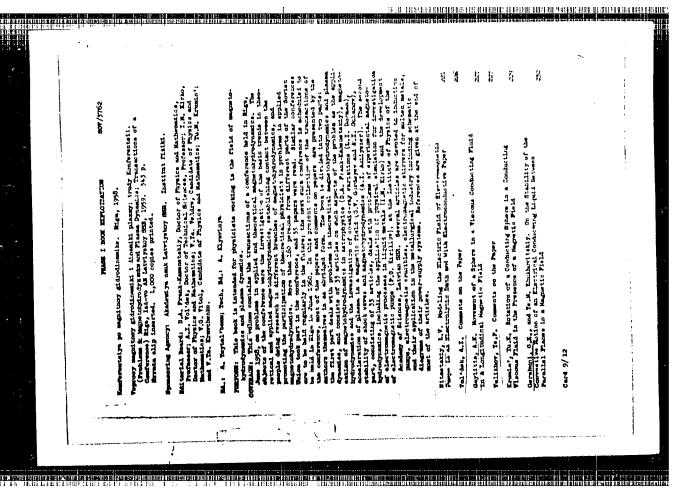
ASSOCIATION: Pernakiy gosudarstvenny universitet (State University

Perm) , Permskiy gosmiarstvennom pedagogich makiy institut

(Perm State Pedagogic Institute)

SUBMITTED: Sentember 19, 1957

Card 4/4



24(8) AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M. SOY/20-124-2-15/71

TITLE:

A Closed Convective Boundary Layer (Zamknutyy konvektivnyy pogranichnyy sloy)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 2, pp 296-300

(USSR)

ABSTRACT:

The present paper solves the problem of the closed convective boundary layer in a horizontal circular cylinder. The surface of the cylinder with a radius R is kept at the temperature $T_0 = \mathbb{H} \sin x$, where x denotes the coordinate along the circle and

 Θ a time-constant amplitude. The temperature assumed to be homogeneous in the core is considered to be the temperature of reference. The core is assumed to rotate as a solid at the rate $v_{\varphi} = \omega r$, where the angular velocity ω is required. The boundary layer equations (in disregard of the curvature of the layer and with introduction of dimensionless variables) are:

 $v_{x} \frac{\partial v_{x}}{\partial x} + v_{y} \frac{\partial v_{x}}{\partial y} = \frac{\partial^{2} v_{x}}{\partial y^{2}} + G \sin x T$

Card 1/3

A Closed Convective Boundary Layer

SOV/20-124-2-15/71

$$v_x \frac{\partial T}{\partial x} = v_y \frac{\partial T}{\partial y} = \frac{1}{Pr} \frac{\partial^2 T}{\partial y^2} ; \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} = 0$$

Here $G = g \beta \otimes R^3/v^2$ denotes the Grasskhof number and

 $Pr = v/\chi$ the Prandtl number. The velocity layer and the temperature layer are assumed to have the same thickness $\delta(\delta \ll 1)$. The temperature and the velocity on the surface of the cylinder and on the boundary layer against the core are assumed to satisfy the usual boundary conditions, besides which there is a number of additional conditions. Besides, temperature and velocity must, as function of x, satisfy the condition of cyclisity. The approximated solution of the above equations is set up in the form

 $v_x = \overline{\omega}(P_1 + P_2 \cos 2x + \beta P_3 \sin 2x), T = Q_1 \sin x + \alpha Q_2 \cos x$. The functions written down above have the necessary periodicity with respect to x. The coefficients P and Q can be selected as polynomials of y in such a manner that they satisfy the above conditions. The polynomials are also explicitly written down.

Card 2/3

A Closed Convective Doundary Lager

307, 20-124-2-15,71

The authors do not give the entire calculations but only the final formulas: $\omega = 0.629 (v/R^2)(G/Fr)^{1/2}$;

 δ = 4.34 H(C Pr)^{-1/4}; α = -2.69; β = -(4.03 + 1.55/Pr). By means of the formulas derived it is possible to calculate the density of the heat flow on any point of the surface. Finally, a formula is given for the total heat current passing through the cross section. The condition for the existence of the investigated convective motion is GPr 350. At low values of the Rayleigh (Reley) - parameter GPr there is a weak convection without the formation of a boundary layer. There are 1 figure and 4 references, 1 of which is Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet im. A. M. Gor'kogo

(Perm State University imen A. M. Gor'kiy)

Permskiy pedagogicheskiy institut (Perm Pedagogical Institute)

PRESENTED:

September 20, 1958, by M.A. Leontovich, Academician

SUBMITTED:

September 19, 1950

Card 3/3

GERSHUNI, G. Z., ZHUKHOVITSKIY, E. M. (Perm)

"On the Motion of an Electrically Conducting Fluid Surrounding a Rotating Sphere in the Presence of a Magnetic Field."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb 1960.

88010

s/170/60/003/012/007/015 8019/8056

//. 7200 AUTHORS:

Gershuni. G. Z., Zhukhovitskiy, Ye. M.

TITLE:

Heat Transfer Through a Vertical Gap With Rectangular Cross

Section in the Case of Strong Convection

PERIODICAL:

Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 12,

pp. 63-67

TEXT: It is assumed that in the rectangular gap investigated in the present paper, the temperatures of its vertical walls are constant and amount to -0 and +0. In the horizontal cross sections the temperature changes from -0 to +0. First, the flow function is derived, the boundary layer being assumed to be considerably thinner than the thickness d and the height h of the gap. Next, the motion in the boundary layer is investigated. A system of equations for the velocity and the temperature of a liquid in the gap is given and approximate solutions are obtained. As a condition for the applicability of the approximate solutions obtained

here, $GrPr \gg 50\ell^{3/2}$, where Gr is the Grasshoff number, Pr the Prandtl

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"APPROVED FOR RELEASE: 09/24/2001

CIA-RDP86-00513R000514920011-8

88010

Heat Transfer Through a Vertical Gap With Rectangular Cross Section in the Case of Strong Convection

S/170/60/003/012/007/015 B019/B056

number, and $\ell=h/d\geqslant 1$. Finally, a formula for the heat transfer through the gap is obtained. System of equations for velocity and temperature of the liquid:

$$\frac{d^{2}u}{dx} \frac{d^{2}v}{dx} + \frac{d^{2}v}{dx} \frac{d^{2}v}{dx} + \frac{d^{2}v}{dx} \frac{d^{2}v}{dx} - \frac{d^{2}v}{dx}$$
(5)

$$v_{x} \partial T/\partial x + v_{y} \partial T/\partial y = (1/Pr) \partial^{2} T/\partial y^{2}$$
 (6)

$$\frac{\partial \mathbf{v}_{\mathbf{x}}}{\partial \mathbf{x}} + \frac{\partial \mathbf{v}_{\mathbf{y}}}{\partial \mathbf{y}} = 0 \tag{7}$$

The approximate solutions are:

$$v_{x} = p_{0}(z) + p_{1}(z)U(x) + p_{2}(z)\cos\frac{2\pi x}{1+1}$$
 (8)

$$T = q_1(z)T_0(x) + q_2(z)\cos\pi x/(1+1)$$
 (9)

 $\gamma(x)$ is a function, which for the upper and the lower wall of the gap is 0, for the lateral walls -1 or +1. $z=y/\delta$, where δ is the thickness of the boundary layer, the coefficients p_i and q_i must be taken as polynomials corresponding to the boundary conditions. For the heat transfer through

Card 2/3

88010

Heat Transfer Through a Vertical Gap With Rectangular Cross Section in the Case of Strong Convection

S/170/60/003/012/007/015 B019/B056

the gap the relation

Q =
$$-c$$
 $\left(\frac{\partial T}{\partial y}\right)_0 dx = 0.739 \times (GrPr)^{1/4} 19/8$

was obtained. There are 1 figure and 4 references: 3 Soviet.

ASSOCIATION: Gosudarstvennyy universitet, Gosudarstvennyy pedagogicheskiy institut, g. Perm' (State University, State Pedagogical

Institute, Perm')

SUBMITTED:

May 27, 1960

Card 3/3

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

5/057/60/030/008/007/019 B019/B060

AUTHORS:

Gershuni, G. Z., Zhukhovitskiy, Ye. M.

TITLE:

The Flow of a Conductive Liquid Around a Sphere in a Strong Magnetic Field

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960. Vol. 30, No. 8,

pp, 925 - 926

TEXT: The authors consider the flow around a sphere of a conductive liquid with a low Reynolds number in a magnetic field. The field direction is assumed to lie in the direction of flow. They proceed from the steadystate equations (2) and (3) in nondimensional quantities, and obtain solutions (4) which, for weak magnetic fields, correspond to the results obtained by Chester (Ref. 1). The calculation of the coefficients is dealt with, and it is finally stated that with large field strengths resisting power grows proportionally with the field. There are 4 references: 3 Soviet and 1 American.

Card 1/2

The Flow of a Conductive Liquid Around a Sphere S/057/60/030/008/007/019 in a Strong Magnetic Field B019/B060

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University).

Permskiy pedagogicheskiy institut (Perm' Pedagogical Institute)

SUBMITTED: February 22, 1960

s/057/60/030/009/011/021 3019/B054

26.1410 AUTHORS:

Gershuni, G. Z. and Zhukhovitskiy, Ye. M.

TITLE:

Rotation of a Sphere in a Viscous Conducting Liquid in a

Magnetic Field

PERIODICAL:

Zhurnal tekhnicheskoy fiziki, 1960, Yol. 30, No. 9,

TEXT: The authors study the motion of a viscous incompressible conducting liquid around a steadily rotating sphere in the presence of a magnetic field in the direction of the rotational axis. They assume the case of slow rotation in which the inertial forces can be neglected as compared with the viscous forces, i.e., they assume a low Reynolds number. The magnetic Reynolds number is also assumed to be low. The authors obtain expressions for the distribution of the velocity and the induced field, as well as formulas for the braking moment. In the case of weak fields, the braking moment increases proportionally to the square field strength. In the case of high field strengths, the dependence is linear. The problem arising with slow rotation of the sphere in a conducting liquid in a Card 1/2

Rotation of a Sphere in a Viscous Conducting S/057/60/030/009/011/021 Liquid in a Magnetic Field B019/B054

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longitudinal magnetic field was solved in successive approximation by Yu. K. Krumin' (Ref. 1). He found a solution of this problem for weak fields in which the velocity distribution differs only slightly from that without a field. In the present paper, the authors obtain a general solution which also holds for strong fields. In this connection, the authors set up, in the first part, a linearized equation of motion of a viscous incompressible conducting liquid in dimensionless parameters. They obtain solutions for the velocity of the medium and the field strengths with the aid of Legendre polynomials and Bessel functions after a projection of the said equation of motion on the Z-axis which coincides with the rotational axis and the magnetic field direction. These general solutions are discussed for weak and strong fields. There are 3 Soviet references.

ASSOCIATION:

Permskiy gosudarstvennyy universitet (Perm' State University).

Permskiy gosudarstvennyy pedagogicheskiy institut

(Perm' State Pedagogical Institute)

SUBMITTED:

March 25, 1960

Card 2/2

831.85

\$/056/60/039/002/022/044 B006/B056

24.7900 AUTHOR:

TITLE:

14.1800

Gershuni, G. Z.

A Mechanism of Ultrasonic Absorption in Paramagnetic

Metals Placed in a Magnetic Field

PERIODICAL: Zhurnal eksperimentalinoy i teoreticheskoy fiziki, 1960.

Vol. 39, No. 2(8), pp. 362-363

TEXT: In a medium that is located in an external magnetic field and whose susceptibility is temperature-dependent, temperature as well as magnetic ration oscillations occur at every point of the medium during the passage of longitudinal sound waves. If the medium is conductive, currents are, besides, induced, which entail additional sound absorption. The author estimates the absorption of a plane wave in an isotropic medium, which is due to this effect. If H | k (k - sound wave vector), no current is induced. If H | k, the greatest effect is produced. In this case, a transverse current wave occurs, which propagates at sonic velocity, and which is polarized perpendicular to H and k. Its amplitude is given by equation (1). The dissipation and the absorption coefficient are calculated from

Card 1/3

83185 \$/056/60/039/002/022/044 A Mechanism of Ultrasonic Absorption in B006/B056 Paramagnetic Metals Placed in a Magnetic Field this relation. It is found that, if $\lambda/\delta\gg 1$ ($\delta=skin\ depta$), i.e., if frequency is low, the absorption coefficient grows proportional to the square of the frequency. At high frequencies $(\lambda/\delta \ll 1)$, practically at $\omega \sim 10^8 \, {\rm sec}^{-1}$), a limit γ_m is attained, which is given by formula (2). Pield and frequency dependence of the absorption coefficient are the same as in a conducting medium moving in a sound wave within a magnetic field (Ref. 2). The ratio between the absorption coefficient given by (2) and the coefficient of absorption due to Foucault currents equais $(aT/\mu)^2(\partial\mu/\partial T)^2$ (μ - magnetic permeability). This ratio is nearly always small; only paramagnetic rare earths have a comparatively large δμ/dT near ferro- and antiferromagnetic transition points, and the effect due to Foucault ourrents may become considerable as, e.g., in dysprosium at 180°K, where 3µ/3T \$0.0: deg. 1. The parameter a is not ex perimentally known for mare earths, the data for "tabulated" metals (some of them are given) are of the order of unity. With a \sim 1. $(aT/\mu)^2 (\partial \mu/\partial T)^2 \approx 3$. With $\sigma \sim 10^{16} \text{ sec}^{-1} \text{ v as } 3.10^5 \text{cm/sec} = 8.6 \text{ g/cm}^3$

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Card 2/3

A Mechanism of Ultrasonic Absorption in Paramagnetic Metals Placed in a Magnetic Field

8/056/60/039/002/022/044 B006/B056

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and H \sim 10⁴ ce, $\gamma_{\rm m} \sim$ 10⁻³ cm⁻¹. Relaxation effects were not taken into account in this estimate. S. A. Al'tshuler is mentioned. There are 4 references: 1 Soviet and 3 US.

ASSOCIATION: Permskiy gosudarstvennyy universitet

(Perm' State University)

SUBMITTED;

February 19, 1960

Card 3/3

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Conductive fluid flowing around a sphere in a strong magnetic field. Zhur.tekh.fiz. 30 no.8:925-926 Ag *60. (MRA 13:8)

1. Permskiy gosudarstvennyy universitet i Permskiy pedagogicheskiy institut.

(Fluid dynamics) (Magnetic fields)

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Heat transfer through a vertical slit with a rectangular cross section in the case of strong convection. Inzh.-fiz. zhur. no.12:63-67 D '60. (MIRA 14:3)

1. Gosudarstvennyy universitet i Gosudarstvennyy pedagogicheskiy institut.

(Reat-Convection)

3711.

24 6714

s/056/62/042/004/033/037 B125/B102

AUTHORS:

Gershuni, G. Z., Zhukhovitskiy, Ye. M.

TITLE:

Convective instability spectrum of a conducting medium in a

magnetic field

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,

ns. 4, 1962, 1122-1125

TEXT: The conditions for oscillatory convective instability of a conducting medium in a magnetic field are determined. A vertical plane layer of a conducting medium is heated from below in a magnetic field. The equilibrium is disturbed so that the velocity \vec{v} and the perturbation of the field \vec{H} are vertical. The temperature perturbation is T = T(x,t), where x is the coordinate taken from the center of the layer in a transverse direction. The pressure gradient is zero, and all quantities depend on the time t as $e^{\lambda t}$. Then, the equations derived from the ordinary

equations of magnetohydrodynamics $\lambda v = v' + RT + M^2H'.$

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 $\lambda PT = v + T'', \quad \lambda P_m H = v' + H'' \tag{1},$

S/056/62/042/004/033/037 B125/B102

Convective instability spectrum ...

(R = Rayleigh number, M = Hartmann number, P = Prandtl number, $P_m = 4\pi\sigma v/c^2$), have the solution $v = v_0 \sin \pi x$, $T = T_0 \sin \pi x$, $H = H_0 \cos \pi x$ (2), if v = 0, T = 0 holds for the ideally conducting boundaries $x = \pm 1$ of the layer. The equations for the eigenvalues λ of the perturbations (2) give the equations $R_1 = \pi^4 + \pi^2 M^2 \frac{(7)}{(7)}$, $R_2 = \pi^4 \frac{(P+P_m)(1+P_m)}{P_m^2} + \pi^2 \frac{1+P_m}{1+P} \frac{P^2}{P_m^2} M^2$,

(8), and $b^2 = \pi^4 \frac{P}{P_m} \left(\frac{M^2}{\pi^4} \frac{P_m - P}{1 + P} - 1 \right).$

for the branches of the stability curves for monotonic and oscillatory perturbations. (7) and (8) are straight lines in the plane (R,M^2) . As V. S. Sorokin pointed out that oscillatory instability occurs with certain properties of the medium $(4\pi\sigma\chi/c^2>1)$ and sufficiently strong fields $(\mathbb{Z} > \mathbb{Z})$. The critical field strength $M^2 = \pi^2(1 + P)(P_m - P)$ follows from the condition $R_1 = R_2$. This condition is evidently fulfilled for cavities of any shape. The necessary condition for the existence of an oscillatory Card 2/3

Convective instability spectrum ...

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instability reads

$$\frac{P_m/P > \int |T|^2 dV \int |\operatorname{rot} \mathbf{H}|^2 dV / \int |\mathbf{H}|^2 dV \int |\nabla T|^2 dV}{(14)},$$

the right-hand side being of the order of 1. There is 1 figure. The English-language reference reads as follows: S. Chandrasekhar. Phil. Mag., 43, 501, 1952.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm State University) Permskiy gosudarstvennyy pedagogicheskiy institut (Perm

State Pedagogical Institute)

SUBMITTED:

November 22, 1961

Card 3/3

8/040/63/027/002/008/019 D251/D308

AUTHORS:

Gershuni, G. Z. and Zhukovitskiy, Ye. M. (Perm')

TITLE:

On the convective instability of a two-component

mixture in a gravitational field

PERIODICAL: Prikladnaya matematika i mekhanika, v. 27, no. 2,

1963, 301-308

TEXT: The authors investigate the problem stated, which so far has been largely ignored by theoretical and practical research workers. The problem of the stability of the convection of a twodimensional vertical layer of the mixture heated from below is solved exactly on the basis of the convective equations of I. G. Shaposhnikov (PMM, v. 17, no. 5, 1953). The possibility of a state of equilibrium is demonstrated, and it is shown that, for equilibrium the density gradient will be constant and transfer equilibrium, the density gradient will be constant and vertical. În contra-distinction from the case of a pure medium, investigated by V. S. Sorokin (PMM, v. 17, no. 1, 1953) there are two possible types of disturbance of the equilibrium position which may arise ..

On the convective ...

\$/040/63/027/002/008/019 D251/D308

i.e. monotonic and oscillatory disturbances. Equations are deduced, in terms of the ordinary and diffusional Rayleigh numbers, for the 'neutral' line and the 'neutral' oscillation respectively, (i.e. the line or oscillation which separates those disturbances which are damped from those which increase monotonically in the second case). It has so far been assumed that the equilibrium gradients of temperature and concentration are independent. In conclusion, the authors investigate the stability of equilibrium when these gradients are connected by some law. It is shown that for normal thermodiffusion only unstable relatively monotonic disturbances are possible, while for anomalous thermodiffusion oscillatory instability is possible, and also monotonic instability with heating from above. There are 3 figures.

SUBMITTED: November 28, 1962

Card 2/2

ACCESSION NR: AP4015965

\$/0040/63/027/005/0779/0783

AUTHORS: Gershuni, G. Z. (Perm'); Zhukhovitskiy, Ye. M. (Perm')

TITLE: Parametric excitation of convective instability

SOURCE: Prikl. matem. i mekhan., v. 27, no. 5, 1963, 779-783

TOPIC TAGS: parametric excitation, convective instability, temperature gradient, nonstationary equilibrium, auto oscillation, parametric resonance, heat equation, skin effect

ABSTRACT: Convective stability of a fluid in a gravity field is generally studied under the assumption that the equilibrium temperature gradient does not depend on time. Nonstationary equilibrium of fluid is also possible, where the equilibrium temperature changes with time by a law determined by nonstationary heating conditions. Apparently, stability of such nonstationary equilibrium has not yet been studied. The authors are interested particularly in the case where the equilibrium temperature gradient changes periodically with time. The fluid is represented as an auto-oscillating system with periodically changing parameter. Under such conditions, interesting phenomena of the parametric resonance type are to be expected. The authors investigate stability of equilibrium of a plane horizontal fluid layer

Card 1/2

ACCESSION NR: AP4015965

with periodically changing temperature gradient. Their solution shows clearly the characteristic peculiarities of the problem. Orig. art. has: 5 figures and 26 formulas.

ASSOCIATION: none

SUBMITTED: 27May63

DATE ACQ: 21Nov63

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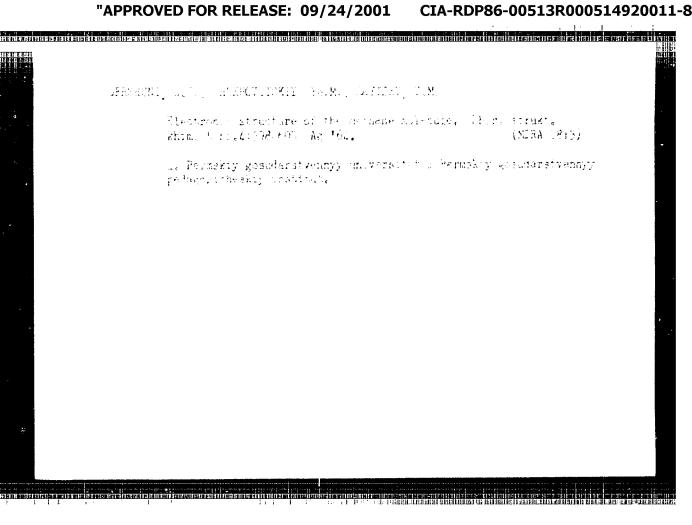
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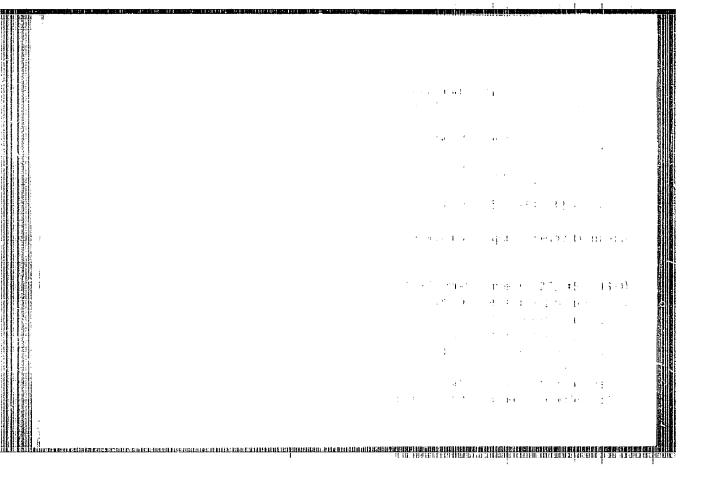
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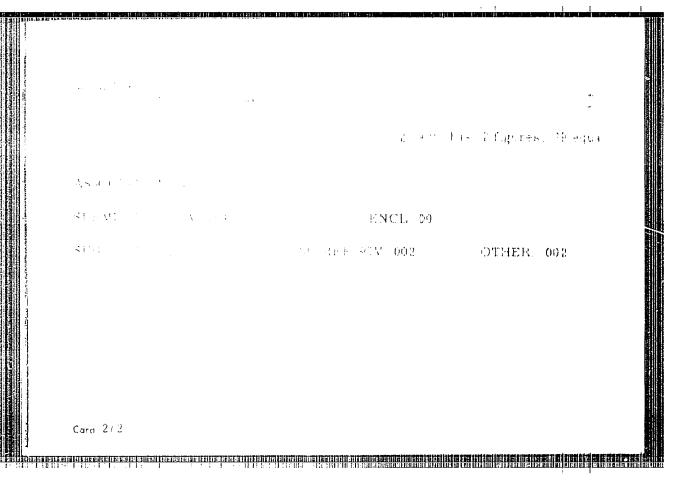
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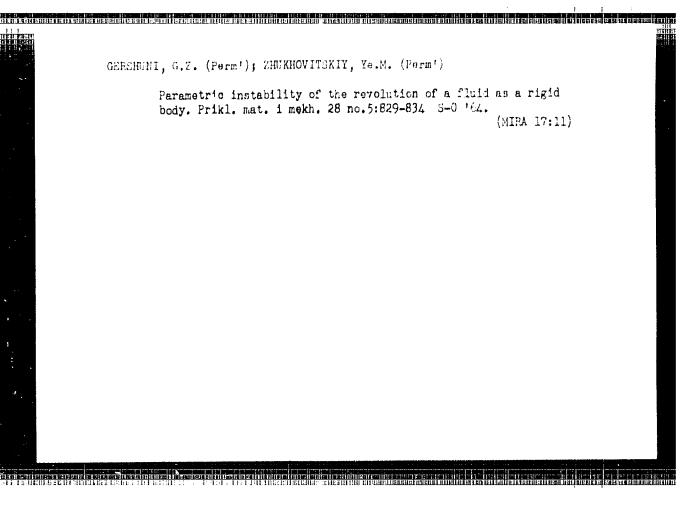
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ACCESSION NR: AP4013424

\$/0057/64/034/002/0336/0339

AUTHOR: Gershumi, G.Z.; Zhukhovitskiy, Ye.M.

TITLE: Rotation of a sphere in a viscous conductive liquid in a magnetic field at large Reynolds numbers

SOURCE: Zhurnal tekhn.fiz.,v.34, no.2, m 1964, 336-339

TOPIC TAGS: magnetohydrodynamics, turbulent magnetohydrodynamics, turbulence, boundary layer, magnetohydrodynamic boundary layer

ABSTRACT: The rotation of a non-conducting sphere in a viscous conducting liquid in the presence of a uniform magnetic field parallel to the axis of rotation is discussed. The hydrodynamic Reynolds number is assumed to be large, so that a boundary layer is formed; the magnetic Reynolds number is assumed to be small, so that the induced field is small compared with the applied field. The velocity of the liquid in the boundary layer of uniform thickness d is assumed to be given by $v_{\varphi} = \omega R (1-x)^2 \sin \theta; \quad v_{\theta} = a \omega R x (1-x)^2 \sin 2\theta$

where r, θ , ϕ are the usual spherical coordinates, R is the radius of the sphere, a is a constant to be determined with d, and

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